UNBRIDLED LEARNING
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GRADE
6

KENTUCKY

K-PREP
Kentucky Performance Rating For Educational Progress

MATH SAMPLE ITEMS

Spring 2013

EVERY CHILD

PROFICIENT & PREPARED FOR
S U C C E S S
KENTUCKY DEPARTMENT OF EDUCATION

The following are the general guides that will be used to evaluate your responses to short-answer and extended-response questions in this test.

Kentucky Short-Answer Questions General Scoring Guide

Score Point 2

- You complete all components of the question and communicate ideas clearly.
- You demonstrate an understanding of the concepts and/or processes.
- You provide a correct answer using an accurate explanation as support.

Score Point 1

- You provide a partially correct answer to the question and/or address only a portion of the question.
- You demonstrate a partial understanding of the concepts and/or processes.

Score Point 0

- Your answer is totally incorrect or irrelevant.

Blank

- You did not give any answer at all.

Kentucky Extended-Response Questions General Scoring Guide

Score Point 4
- You complete all important components of the question and communicate ideas clearly.
- You demonstrate in-depth understanding of the relevant concepts and/or processes.
- Where appropriate, you choose more efficient and/or sophisticated processes.
- Where appropriate, you offer insightful interpretations or extensions (generalizations, applications, analogies).

Score Point 3
- You complete most important components of the question and communicate clearly.
- You demonstrate an understanding of major concepts even though you overlook or misunderstand some less-important ideas or details.

Score Point 2
- You complete some important components of the question and communicate those components clearly.
- You demonstrate that there are gaps in your conceptual understanding.

Score Point 1
- You show minimal understanding of the question.
- You address only a small portion of the question.

Score Point 0
- Your answer is totally incorrect or irrelevant.

Blank
- You did not give any answer at all.

1

The chart shows folder prices at different stores.

Folder Prices

Store	Cost
A	7 for 42¢
B	6 for 50¢
C	8 for 56¢
D	9 for 72¢

Which store has an exact rate of 8¢ per folder?

A Store A
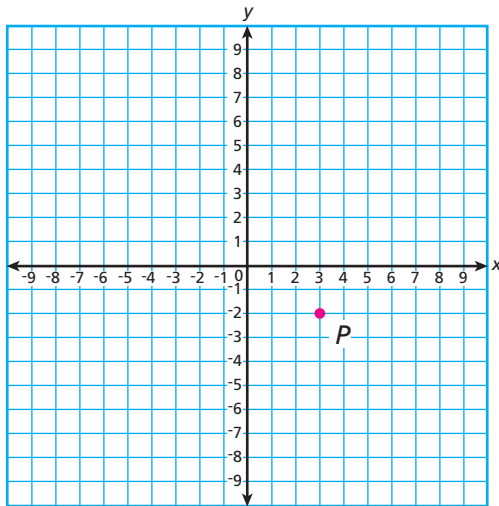
B Store B

C Store C

D Store D

2

According to the 2010 Census, Bracken County, Kentucky, had 101 fewer people than Gallatin County. Let p represent the number of people in Bracken County. Which expression has a value equal to the number of people in Gallatin County based on the 2010 Census?

A $p + 101$

B $p - 101$

C $101 - p$

D $101p$

3

The graph below shows point *P*.

Which coordinates for points *M* and *N* would form right △*MNP* with a right angle at point *P* and side lengths of 4 units and 5 units?

A $M(^-1, ^-2); N(3, ^-6)$
B $M(3, ^-7); N(^-2, ^-2)$
C $M(^-1, ^-6); N(^-2, 3)$
D $M(^-1, ^-2); N(3, 3)$

4

Each morning Shania puts $\frac{3}{4}$-cup of cereal in her bowl. The cereal box contains 9 cups of cereal. How many $\frac{3}{4}$-cups, *x*, are equivalent to 9 cups?

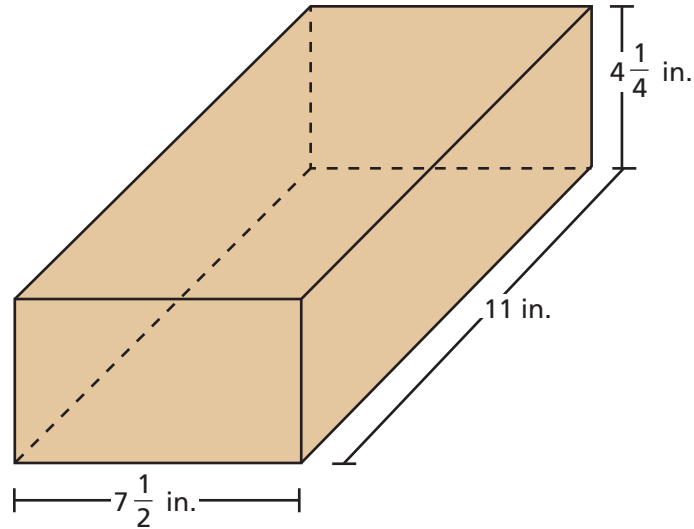A $9 \cdot \frac{3}{4} = x; x = 6\frac{3}{4}$

B $9 - \frac{3}{4} = x; x = 8\frac{1}{4}$

C $9 + \frac{3}{4} = x; x = 9\frac{3}{4}$

D $9 \div \frac{3}{4} = x; x = 12$

5

Myrna has a photograph storage box in the shape of a right rectangular prism, as shown.

Photograph Storage Box

$4\frac{1}{4}$ in.

11 in.

$7\frac{1}{2}$ in.

What is the volume, in cubic inches, of the photograph storage box? $(V = lwh)$

A $22\frac{3}{4}$

B $45\frac{1}{2}$

C $239\frac{3}{4}$

D $350\frac{5}{8}$

6

Part A What is the opposite of 8? Explain your thinking.

Part B Explain if $-(^-8)$ and $-|^-8|$ result in the same value.

RUBRIC	
Score Point 2	• You complete all components of the question and communicate ideas clearly. • You demonstrate an understanding of the concepts and/or processes. • You provide a correct answer using an accurate explanation as support.
Score Point 1	• You provide a partially correct answer to the question and/or address only a portion of the question. • You demonstrate a partial understanding of the concepts and/or processes.
Score Point 0	• Your answer is totally incorrect or irrelevant.
Blank	• You did not give any answer at all.
Note: No part can be incomplete or incorrect and receive full credit.	

Correct Answer:

Part A −8
The number 8 is 8 units to the right of 0 on a number line so the opposite of 8 would be the number that is 8 units to the left of 0 on a number line which is -8.

OR similar explanation

Part B No, $-(-8)$ and $-|-8|$ do not result in the same value.

$-(-8)=8$ and $-|-8|=-8$; One deals with the opposite of an opposite and the other is the opposite of the absolute value of the opposite of 8.
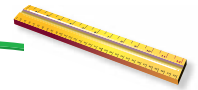
OR similar explanation

Annotated Student Response

SAMPLE 2-POINT RESPONSES

> 1. A. The opposite of 8 is -8 because the opposite of a positive # is always the same # only negative
> B. -(-8) is not the same as -|-8| because a negative negative # is a positive # so -(-8) is 8. -|-8| is not equal to that because the absolute value of -8 is 8 so -|-8| is -8 so that proves that -(-8) ≠ -|-8|

ANNOTATION — 2-POINT RESPONSE
The student completes all components of the question and communicates ideas clearly.

Part A: The student provides a correct answer *"The opposite of 8 is -8"*. The student explains, *"because the opposite of a positive # is always the same # only negative"*
Part B: The student correctly explains *"-(-8) is not the same as -|-8| because a negative negative # is a positive # so –(-8) is 8. -|-8| is not equal to that because the absolute value of -8 is 8 so -|-8| is -8."*

Overall, the student earns 2 points.

Annotated Student Response

SAMPLE 1-POINT RESPONSE

ANNOTATION — 1-POINT RESPONSE

The student provides a partially correct answer to the question and addresses only a portion of the question.

Part A: The student correctly explains *"The opposite of eight is -8…because on a number line you see that 8 & -8 are the same distance from zerow."* The student illustrates his explanation by drawing a number line.

Part B: The student provides an incorrect answer of *"They are the same thing because preinthsey & brackets are the same thing."*

Overall, the student earns 1 point.

Annotated Student Response
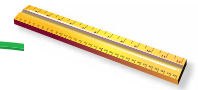
SAMPLE 0-POINT RESPONSE

ANNOTATION – 0-POINT RESPONSE

The student's answer is totally incorrect.

Part A The student provides an incorrect answer of *"4"* and explains *"Because if you add 4 and 4 it is 8"*.

Part B The student incorrectly answers the question *"Yes"* and explains *"Because ( ) means it comes first this means || that it is last."*

Overall, the student earns 0 points.

7

A container for a perfume bottle is in the shape of a right triangular prism. The container has a height of 15 centimeters. The dimensions of the base of the right triangular prism are shown below.

Base of Container

10 cm   6 cm

8 cm
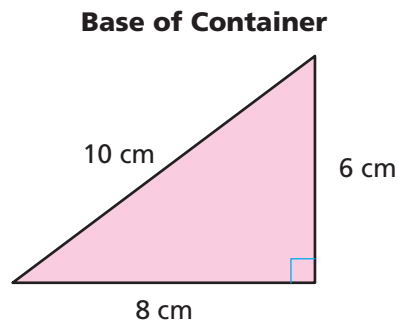
Part A On your answer document, draw a net for the right triangular prism based on the given dimensions. Make sure to label the length and width of each rectangle and the base length and height of each triangle.

Part B A smaller right triangular prism container with dimensions that are half the length of those used for the net in **part A** is used for a smaller bottle of perfume. Explain if the surface area of the smaller prism is half the surface area of the larger prism.
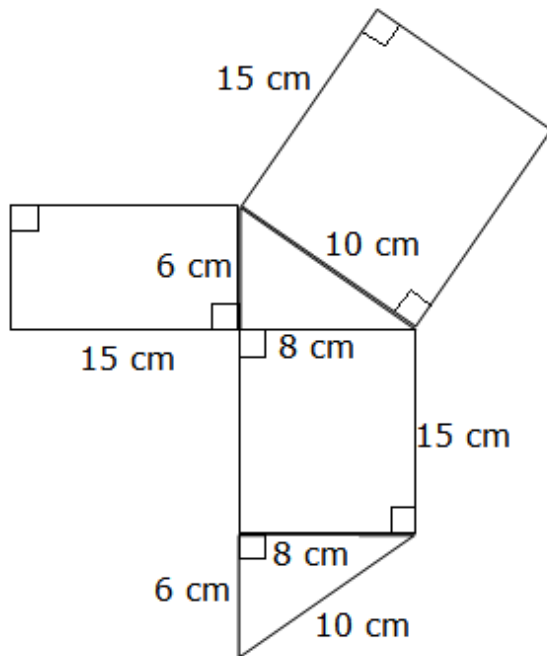
RUBRIC	
Score Point 2	• You complete all components of the question and communicate ideas clearly. • You demonstrate an understanding of the concepts and/or processes. • You provide a correct answer using an accurate explanation as support.
Score Point 1	• You provide a partially correct answer to the question and/or address only a portion of the question. • You demonstrate a partial understanding of the concepts and/or processes.
Score Point 0	• Your answer is totally incorrect or irrelevant.
Blank	• You did not give any answer at all.
Note: No part can be incomplete or incorrect and receive full credit.	

Correct Answer:

Part A

OR similar drawing with all three sides of each triangle labeled and at least one length and width on each rectangle

Part B The surface area of the smaller right triangular prism is not one-half the surface area of the larger right triangular prism but one-fourth the surface area of the larger prism because area is two-dimensional so instead of dividing the surface area of the larger prism by 2 you divide by 2^2 or 4.

SA of larger right triangular prism = $15\left(6+8+10\right)+\dfrac{2\left(8\leftrightarrow6\right)}{2}=408$

SA of smaller right triangular prism = $7.5\left(3+4+5\right)+\dfrac{2\left(4\leftrightarrow3\right)}{2}=102$

$\dfrac{102}{408}=\dfrac{1}{4}$ OR $\dfrac{408}{102}=4$
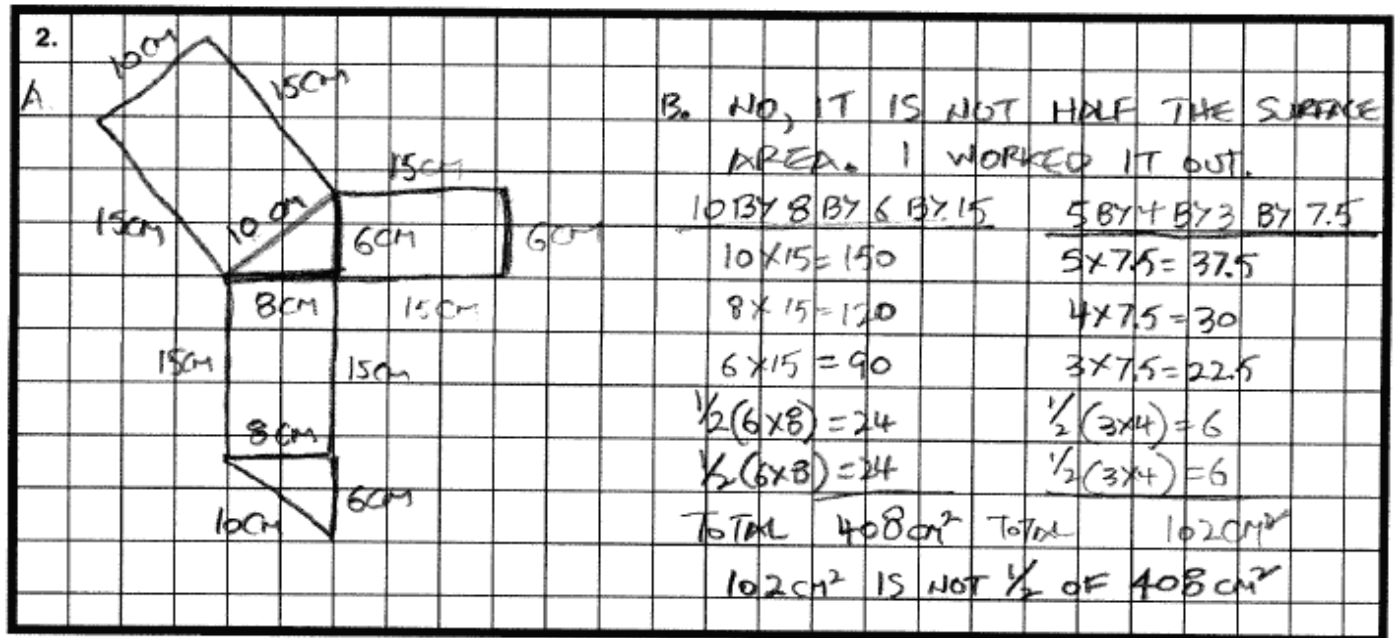
OR similar explanation and work

Annotated Student Response

SAMPLE 2-POINT RESPONSE

NOTE: This is not a student response

ANNOTATION — 2-POINT RESPONSE

The student completes all components of the question and communicates ideas clearly.

Part A: The student correctly draws a net for the right triangular prism and correctly labels all the dimensions.

Part B: The student correctly explains that the surface area of the smaller prism is not half the surface area of the larger prism by calculating the surface area of both prisms and stating *"102 cm² is not half of 408cm²."*
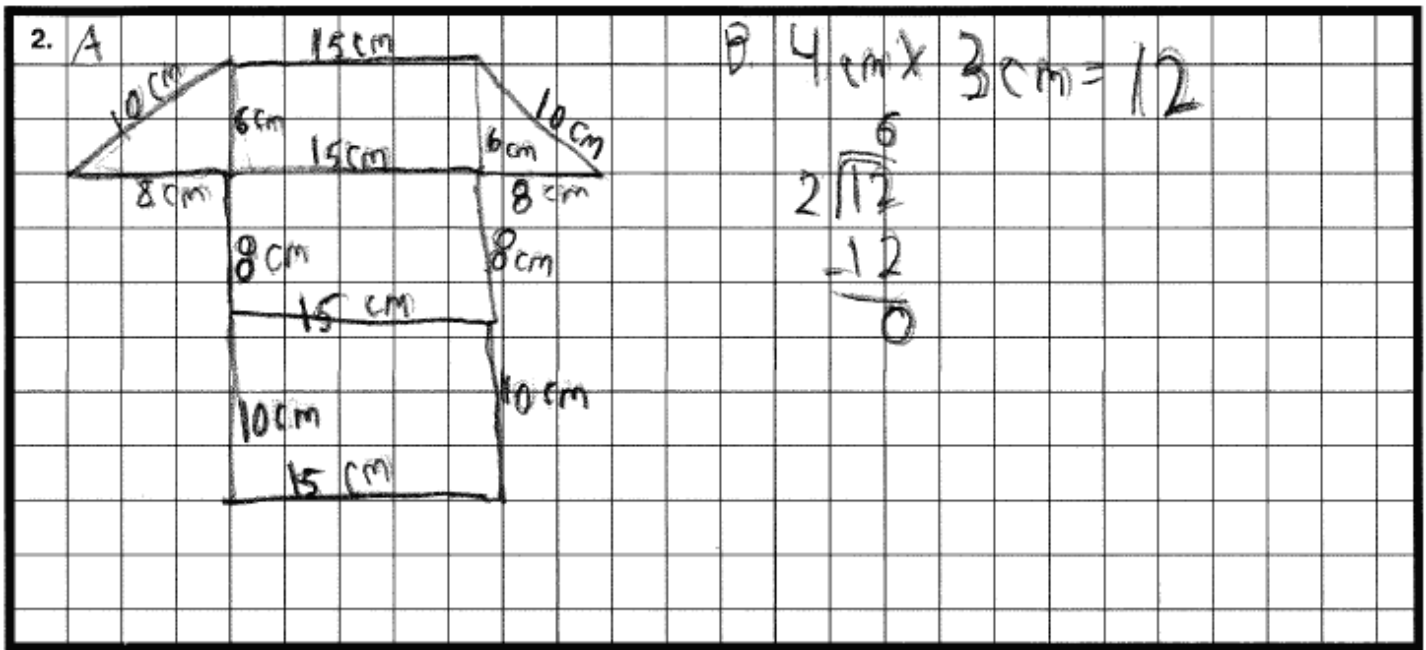
Overall, the student earns 2 points.

Annotated Student Response

SAMPLE 1-POINT RESPONSE

ANNOTATION — 1-POINT RESPONSE

The student provides a partially correct answer to the question and addresses only a portion of the question.

Part A: The student correctly draws a net for the right triangular prism and correctly labels all the dimensions.

Part B: The student fails to correctly explain that the surface area of the smaller prism is not half the surface area of the larger prism.

Overall, the student earns 1 point.

Annotated Student Response

SAMPLE 0-POINT RESPONSE

ANNOTATION – 0-POINT RESPONSE

The student's answer is totally incorrect.

Part A: The student fails to draw a net for the triangular prism.

Part B: The student fails to correctly explain that the surface area of the smaller prism is not half the surface area of the larger prism.
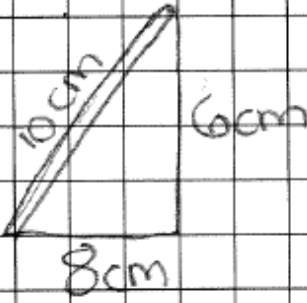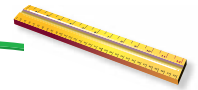
Overall, the student earns 0 points.

8

The temperature, in degrees Fahrenheit, in Little City was recorded at the same time for 14 days. The results are listed below.

45°, 52°, 45°, 48°, 53°, 47°, 45°, 52°, 53°, 56°, 56°, 53°, 45°, 48°

Part A On your answer document, display the data in a dot plot. Label the graph. Make sure to include a title and scale.

Part B Suppose the dot plot you created in **part A** was given first. Explain how you could create the list of the temperatures for the 14 days.

Part C Display the data in a box plot. Label the title, scale, median, lower and upper quartiles, and extremes.

Part D Considering the measures of central tendency, explain if the same information can be determined from the dot plot you created in **part A** and the box plot you created in **part C**.

RUBRIC	
Score Point 4	Student scores 4 points.
Score Point 3	Student scores 3 – 3.5 points.
Score Point 2	Student scores 2 – 2.5 points.
Score Point 1	Student scores 0.5 – 1.5 points. OR Student demonstrates minimal understanding of displaying data.
Score Point 0	Student's response is totally incorrect or irrelevant.
Blank	No student response.
Note: No part can be incomplete or incorrect and receive full credit.	

Score Points

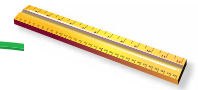**Part A:** score 1 point   correct graph with the title and scale labeled
        OR
        score 0.5 point   correct graph with the title and/or scale not labeled
                           OR
                           mostly correct graph with scale labeled

Part B: score 1 point   correct explanation
        OR
        score 0.5 point   incomplete or vague explanation

Part C: score 1 point   correct graph with correct values labeled and scale labeled
        OR
        score 0.5 point   correct graph with no values labeled and/or no scale labeled
                           OR
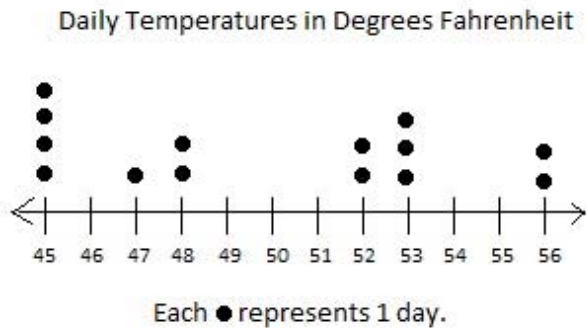   mostly correct graph

  Note: a "mostly correct graph" in **Part C** will be interpreted as meaning that at least four of the seven attributes (title, scale, lower and upper quartiles, median and extremes) are present and correct.

Part D: score 1 point   correct explanation
                        OR
                     answer with correct and complete work or explanation based
                     on incorrect graphic in part C
       OR
       score 0.5 point   incomplete explanation
   OR
                         vague explanation

Correct Answer:

Part A Dot plot with correct labels.

Daily Temperatures in Degrees Fahrenheit

45 46 47 48 49 50 51 52 53 54 55 56

Each ● represents 1 day.

Part B The dot plot displays each of the data points for every dot, the number underneath it would be listed to match the number of times indicated by the dots.

OR similar explanation

Part C Correctly labeled box plot that includes title, scale, lower and upper quartiles, median and extremes.

Daily Temperatures in Degrees Fahrenheit
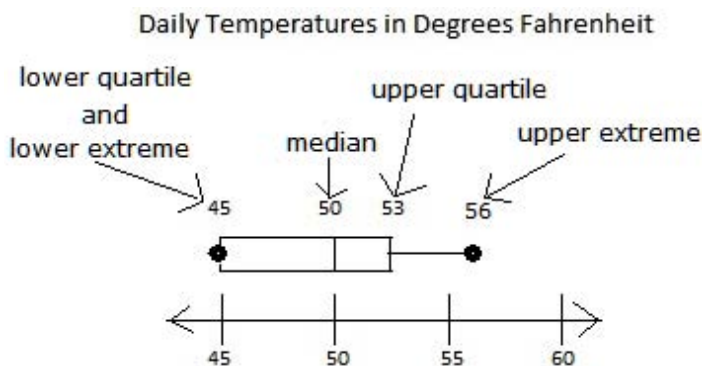
Part D The dot plot shows specific values like the fact that the mode of the data is 45° and other possible repeated data values. The data displayed on the dot plot can be used to calculate the mean, median, and mode. Neither the mode nor the mean can be determined from the box plot. The box plot instantly shows the median of the data unlike the dot plot where it would have to be calculated. The box plot is better at showing the spread of the data compared to the dot plot.
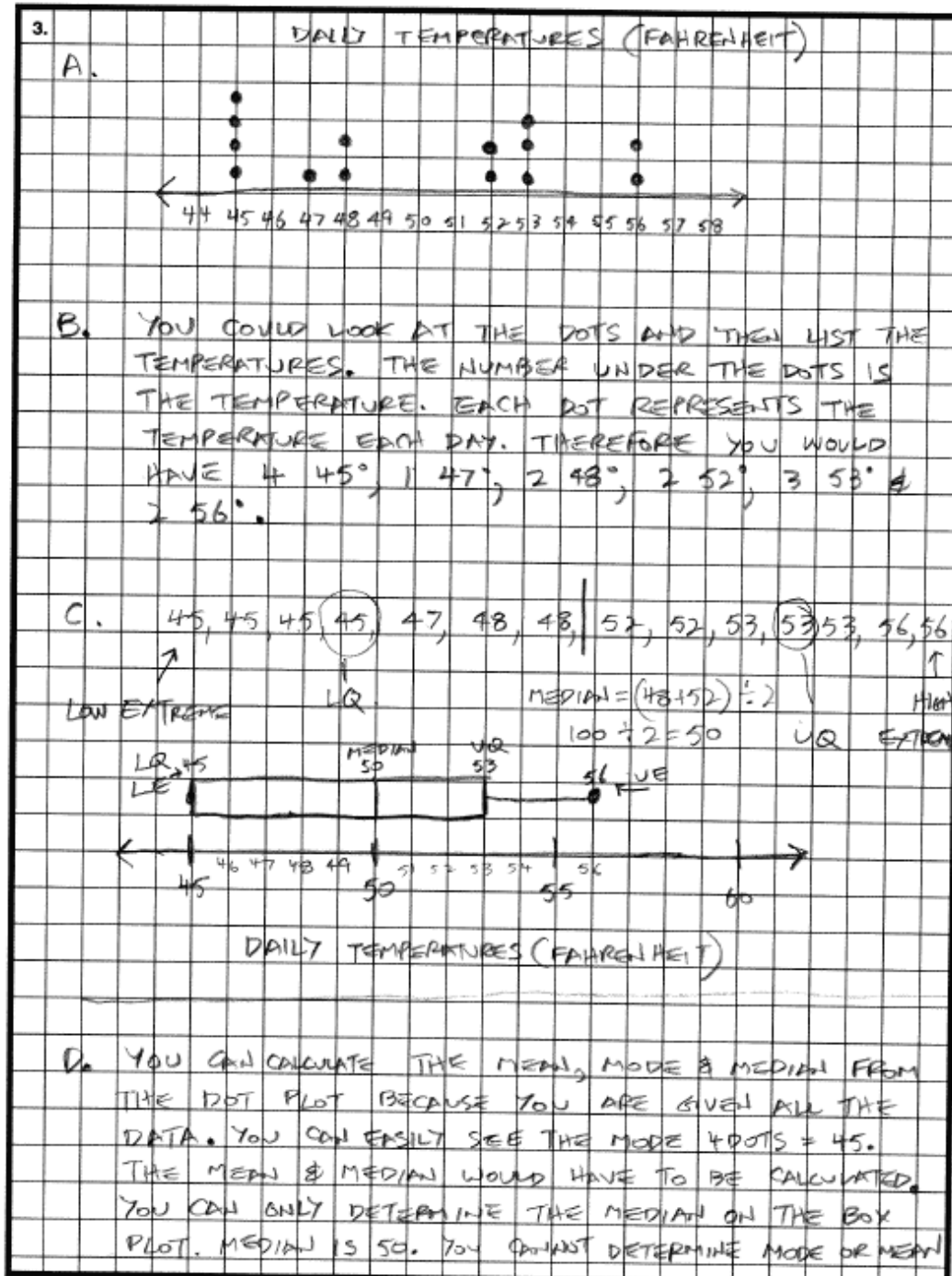
OR similar explanation

Annotated Student Response

SAMPLE 4-POINT RESPONSE   NOTES

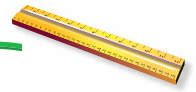**NOTE: This is not a student response**

A 1.0

B 1.0

C 1.0

D 1.0

GRADE 6 —Mathematics

ANNOTATION - 4-POINT RESPONSE

A The student correctly draws a dot plot with a label and a scale and correctly plotted points. (1 point)

B The student correctly explains how a list of the plotted points on the dot plot could be created *"The numbers under the dots is the temperature. Each dot represents the temperature each day."* (1 point)

C The student correctly displays the data in a box plot. The plot has a title and an accurate scale. The median, lower and upper quartiles, and upper and lower extremes are correct and labeled. (1 point)

D The student explains which measures of central tendency can be determined from the two plots *"You can calculate the mean, mode and median from the dot plot because you are given all the data"* and *"You can only determine the median on the box plot."* (1 point)
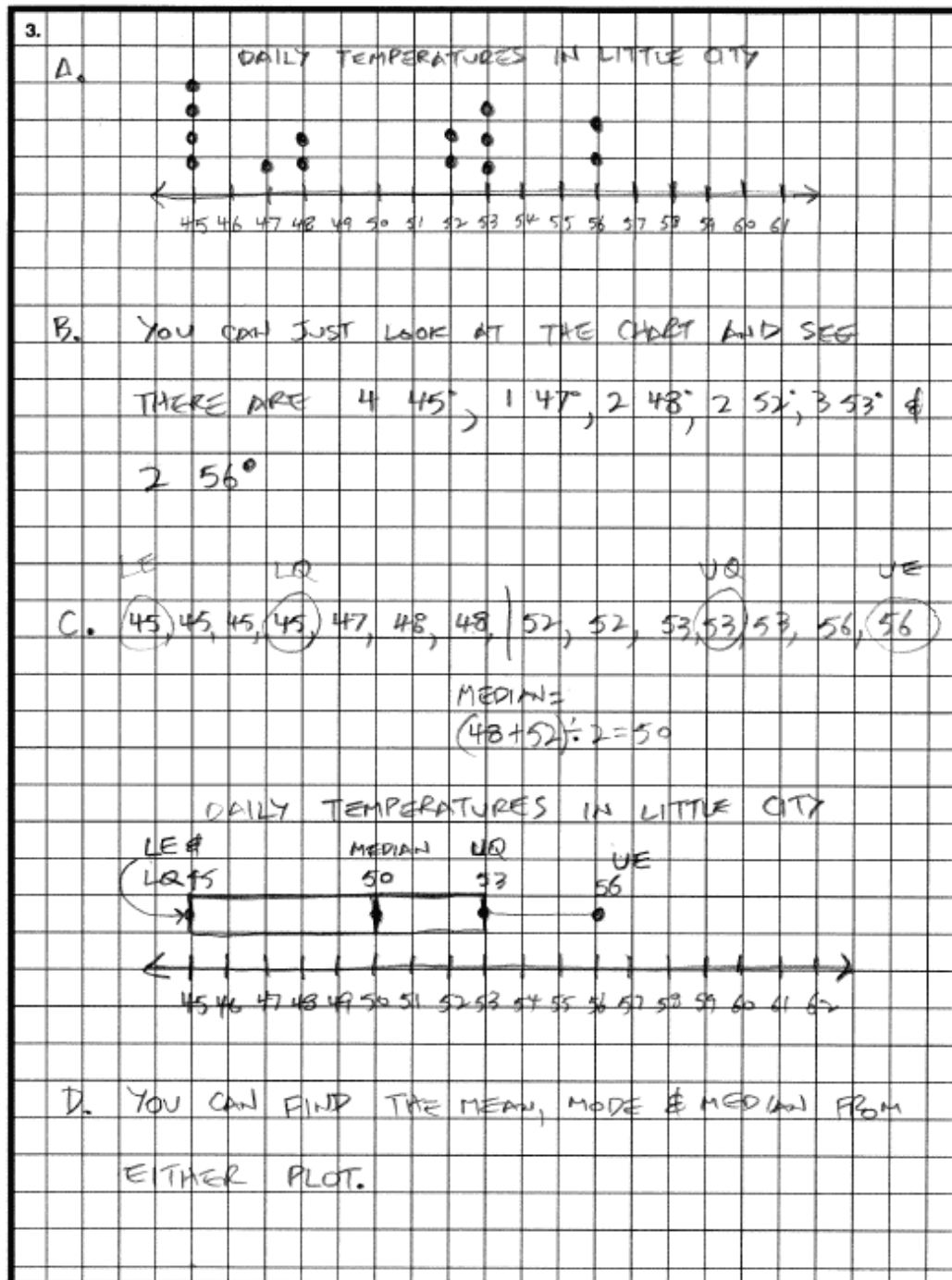
Overall, the student earns 4 points.

Annotated Student Response

SAMPLE 3-POINT RESPONSE   NOTES

NOTE: This is not a student response.

A   1.0

B   1.0

C   1.0

D   0

ANNOTATION - 3-POINT RESPONSE

A The student correctly draws a dot plot with a label and a scale and correctly plotted points. (1 point)

B The student correctly explains how a list of the plotted points on the dot plot could be created. *"You can just look at the chart and see there are 4 45°, 1 47°, 2 48°, 2 48°, 2 52°, 3 53° & 2 56°."* (1 point)

C The student correctly displays the data in a box plot. The plot has a title and an accurate scale. The median, lower and upper quartiles, and upper and lower extremes are correct and labeled. (1 point)

D The student's explanation is incorrect *"You can find the mean, mode and median from either plot."* (0 points)

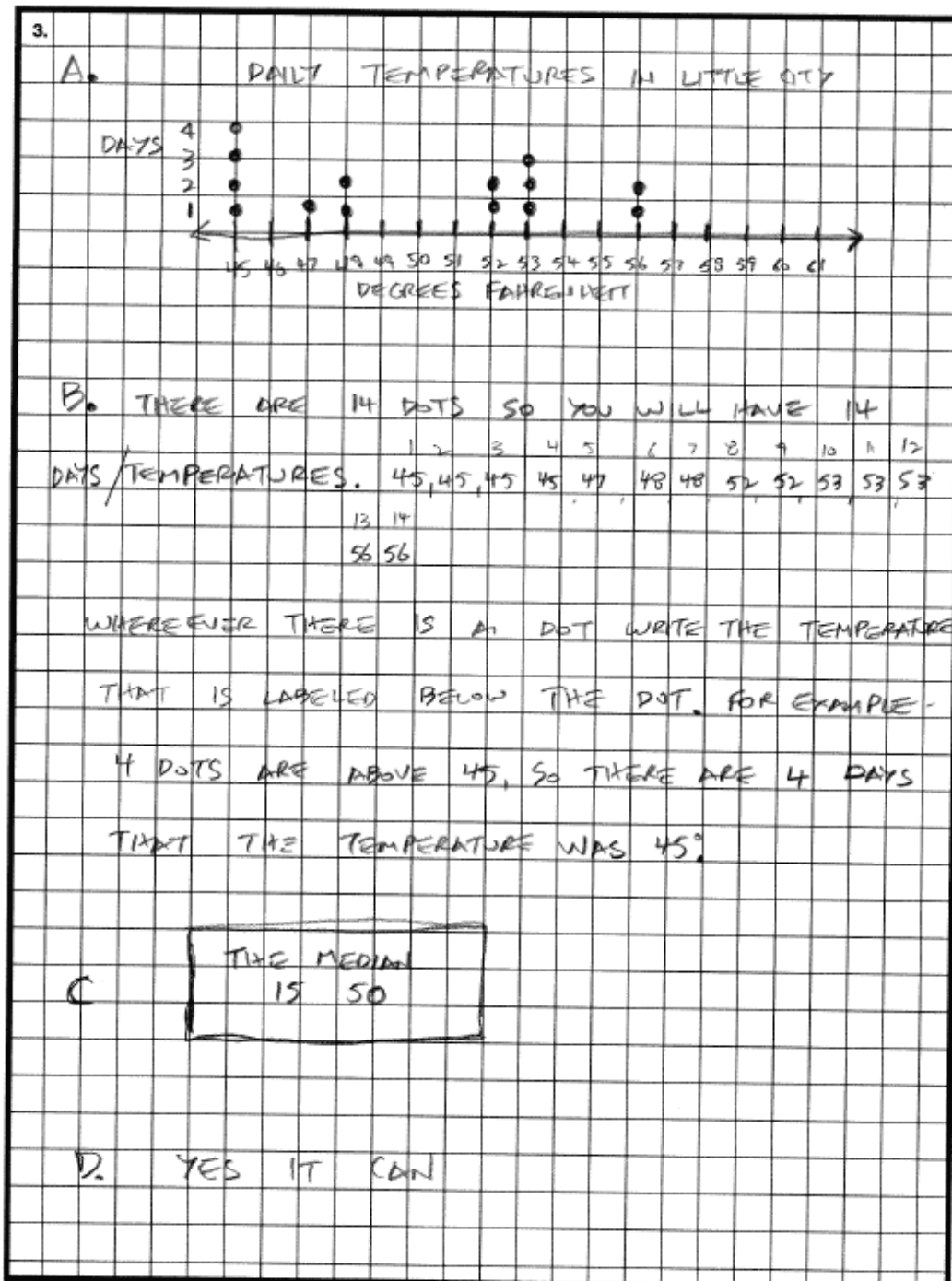**Overall,** the student earns 3 points.

GRADE 6 —Mathematics

Annotated Student Response

SAMPLE 2-POINT RESPONSE   NOTES

This is not a student response.

3.

A. DAILY TEMPERATURES IN LITTLE CITY

DAYS graph with dots over DEGREES FAHRENHEIT (45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61)

A   1

B. THERE ARE 14 DOTS SO YOU WILL HAVE 14

DAYS/TEMPERATURES. 45,45,45 45 47 48 48 52 52 53 53 53   (numbered 1 2 3 4 5 6 7 8 9 10 11 12)

13 14
56 56

WHEREEVER THERE IS A DOT WRITE THE TEMPERATURE

THAT IS LABELED BELOW THE DOT. FOR EXAMPLE

4 DOTS ARE ABOVE 45, SO THERE ARE 4 DAYS

THAT THE TEMPERATURE WAS 45°

B   1.0

C THE MEDIAN
   IS 50

C   0.0

D. YES IT CAN

D   0.0

ANNOTATION - 2-POINT RESPONSE

A The student correctly draws a dot plot with a label and a scale and correctly plotted points. (1 point)

B The student correctly explains how a list of the plotted points on the dot plot could be created. *"There are 14 dots so you will have 14 days/temperatures"* and *"Where ever there is a dot write the temperature that is labeled below the dot."* The student then lists the 14 temperatures. (1 point)

C The student fails to draw a box plot. (0 points)

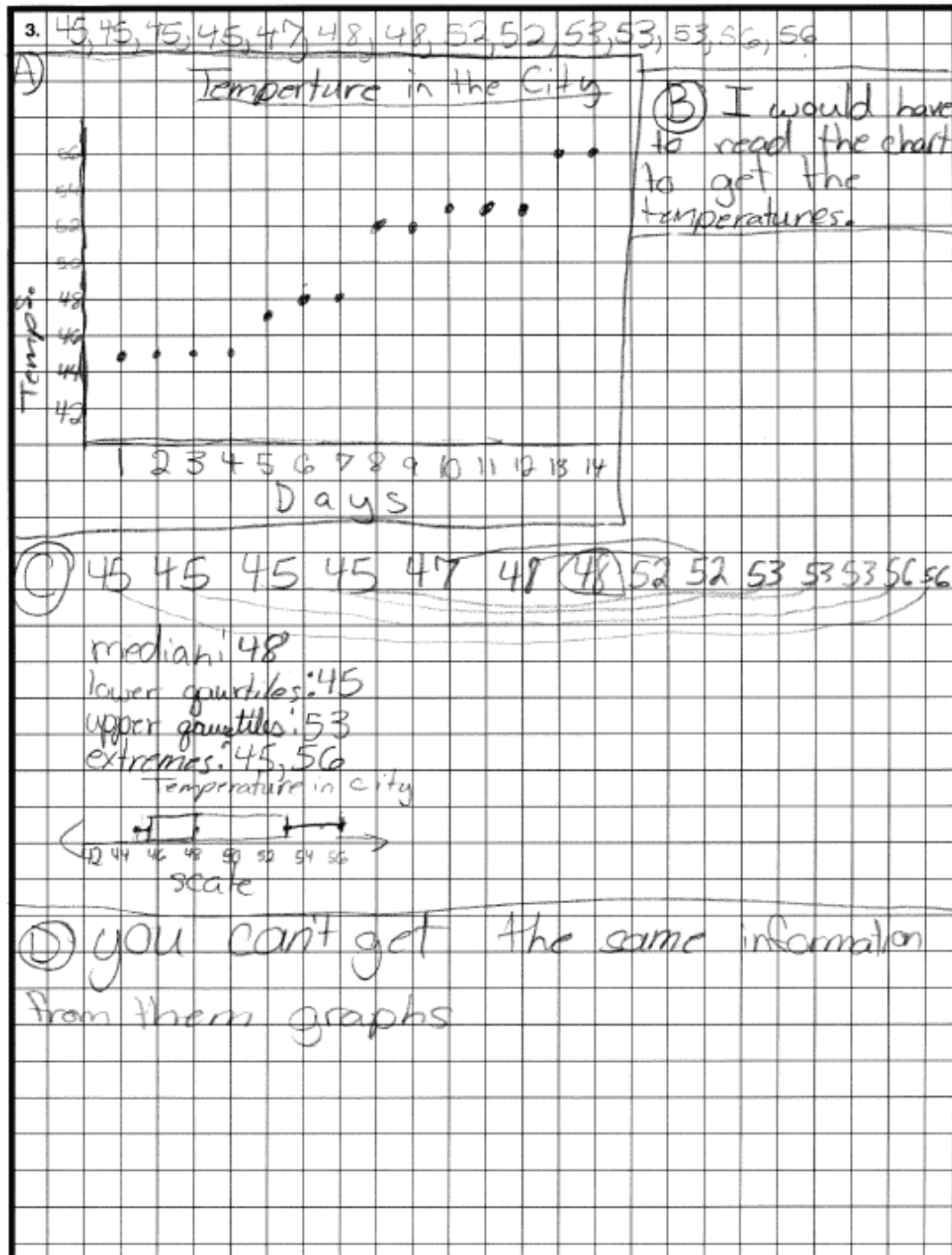D The student response is incorrect. (0 points)

Overall, the student earns 2.0 points.

Annotated Student Response

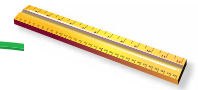**SAMPLE 1-POINT RESPONSE**   NOTES

A   0

B   0.0

C   0.5

D   0.0

ANNOTATION - 1-POINT RESPONSE

A The student fails to create a correct dot plot. (0 points)

B The student fails to create a correct dot plot and so is unable to explain how to create a list of the temperatures from a dot plot. (0 points)

C The student creates a box plot that is mostly correct. Five of the seven attributes are present and correct. The box plot contains a label, a consistent labeled scale, and 3 of the 5 required values are plotted correctly. The upper extreme (56), lower extreme (45) and the upper quartile (53) are plotted correctly. The median is plotted at 48 but should be 50. The lower quartile is plotted at 45.5 but should be 45. The student also writes the values for these 5 points, and only the median is incorrect. (0.5 points)

D The student states *"You can't get the same information from them graphs"* but fails to explain which measures of central tendency can or cannot be determined or why they cannot be determined. (0 points)
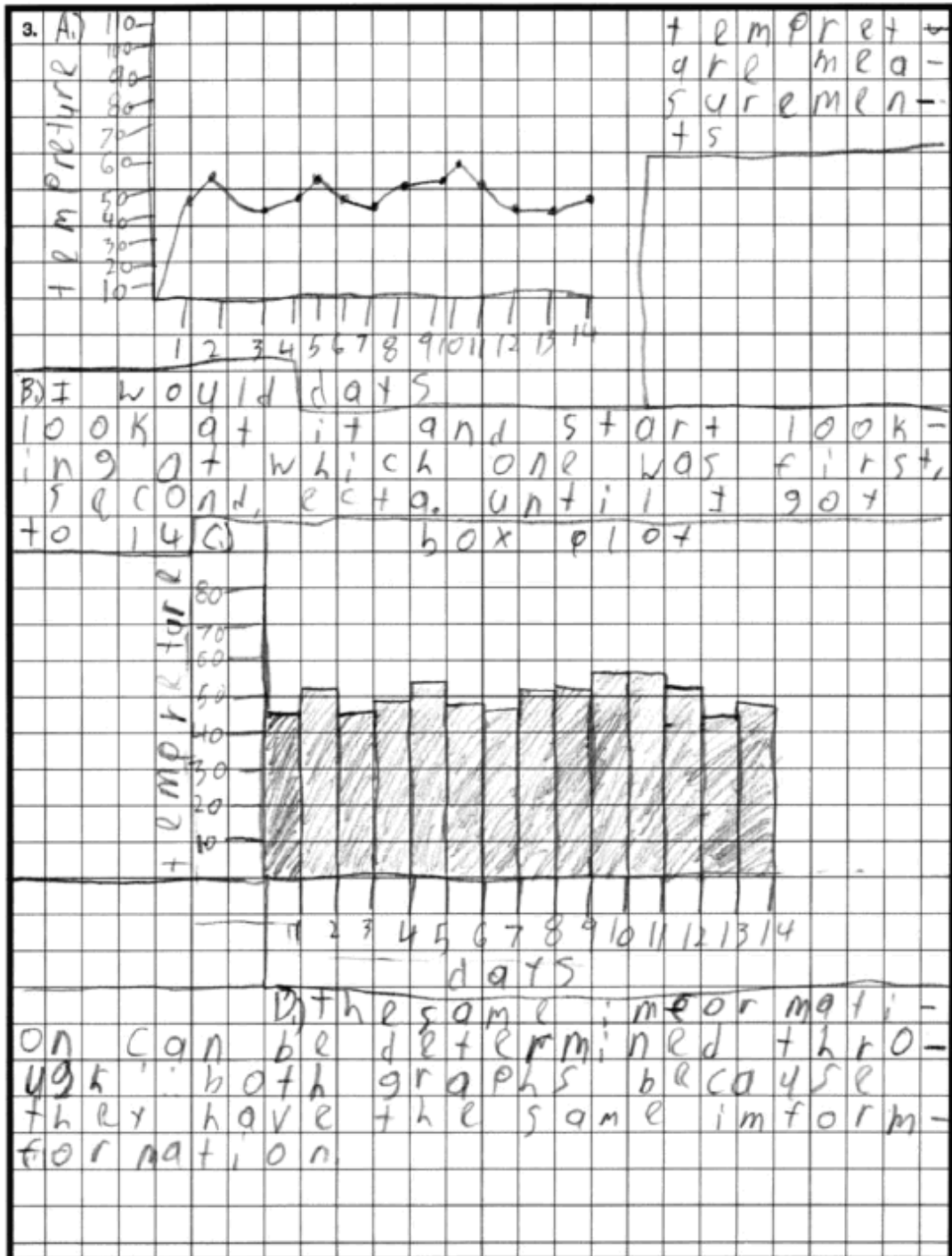
Overall, the student earns 0.5 points.

Annotated Student Response

SAMPLE 0-POINT RESPONSE   NOTES

Ⓐ	0.0
Ⓑ	0.0
Ⓒ	0.0
Ⓓ	0.0

GRADE 6 —Mathematics

ANNOTATION - 0-POINT RESPONSE

A The student fails to draw a dot plot. The student draws a line graph instead. (0 points)

B The student fails to create a correct dot plot and so is unable to explain how to create a list of the temperatures from a dot plot. (0 points)

C The student fails to draw a box plot. The student draws a bar graph instead. (0 points)

D The student's explanation is incorrect. (0 points)

Overall, the student earns 0 points.

Item Information

Question Number	Key	DOK*	KCAS Primary Standard**
1	D	2	6.RP.2
2	A	1	6.EE.2.a
3	D	2	6.NS.8
4	D	2	6.EE.6
5	D	1	6.G.2
6	NA	2	6.NS.6.a
7	NA	3	6.G.4
8	NA	3	6.SP.4

*DOK is the abbreviation for Depth of Knowledge. Please note that DOK is associated to the complexity level of an assessment item and is not aligned to the standard. Further information regarding DOK can be accessed on the Kentucky Department of Education Web site: http://education.ky.gov/curriculum/docs/Pages/Content-Specific-Core-Content-for-Assessment-DOK-Support-Materials.aspx

**Further information regarding Common Core Standards can be accessed on the Common Core Web site: http://www.corestandards.org